

WHAT IS CLAIMED IS:

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1. A method of crystallizing amorphous silicon, comprising the steps of:
depositing an inducing substance for silicon crystallization on an amorphous silicon layer
by plasma exposure; and
annealing the amorphous silicon layer.
 2. A method of crystallizing amorphous silicon, comprising the steps of:
providing a substrate on which an amorphous silicon layer is formed;
depositing an inducing substance for silicon crystallization on the substrate by plasma
exposure; and
annealing the substrate where the inducing substance is deposited.
 3. The method of claim 2, wherein the substrate is prepared by forming the
amorphous silicon layer on an isolated substrate.
 4. The method of claim 3, wherein a buffer layer is formed between the isolated
substrate and the amorphous silicon layer.
 5. The method of claim 2, the method further comprising the step of forming a
second amorphous silicon layer after the plasma exposure.
 6. The method of claim 2, the method further comprising the step of selectively
forming an insulating layer on the substrate before the step of depositing an inducing substance
for silicon crystallization.
 7. The method of claim 1, wherein the plasma is RF plasma.
 8. The method of claim 1, wherein the plasma is a DC plasma.
 9. The method of claim 1, wherein the plasma is microwave plasma.

10. The method of claim 1, wherein temperature of the annealing ranges about 300° to 1000°C.

Sub A2 → 11. The method of claim 1, wherein the inducing substance for silicon crystallization is transition metal.

12. The method of claim 1, wherein the inducing substance for silicon crystallization is noble metal.

13. The method of claim 11, wherein the transition metal is Ni.

14. The method of claim 1, wherein the plasma exposure is carried out for about 0.1 to 1000 second(s).

15. The method of claim 1, wherein the plasma exposure is carried out under the pressure of about 0.5 mTorr ~ 100 Torr.

Sub A3 → 16. A method of crystallizing amorphous silicon, comprising the steps of:
depositing an inducing substance for silicon crystallization on an amorphous silicon layer
by plasma exposure as soon as annealing is carried out on the amorphous silicon layer.

17. The method of claim 16, wherein the substrate is prepared by forming a buffer layer on an insulated substrate and by forming the amorphous silicon layer on the buffer layer.

18. The method of claim 16, the method further comprising the step of forming a second amorphous silicon layer after the plasma exposure for depositing the inducing substance for silicon crystallization.

19. The method of claim 16, the method further comprising the step of selectively forming an insulating layer on the substrate before the step of depositing the inducing substance for silicon crystallization.

20. A method of crystallizing amorphous substance, comprising the steps of:
depositing an inducing substance for crystallization on an amorphous substance layer by plasma exposure; and
annealing the amorphous substance layer.

21. A method of crystallizing amorphous silicon, comprising the steps of depositing an inducing substance for crystallization on an amorphous substance layer by plasma exposure as soon as annealing is carried out on the amorphous substance layer.

Sub 14
22. A crystallizing apparatus comprising:
a chamber having inner space;
a substrate support arranged in the chamber, the substrate support being used for supporting a substrate;
a plasma generating device connected to the chamber, the plasma generating device producing plasma inside the chamber; and
a heater arranged at the substrate support, the heater supplying the substrate with heat.

23. The crystallizing apparatus according to claim 22, the plasma generating device further comprising:
a metal bar being a power supply path for generating plasma as well as a metal source working as a crystallization catalyst; and
an electric power supply connected to the metal bar.

24. The crystallizing apparatus according to claim 22, wherein the chamber has a gas inlet through which gas as a plasma source is provided to the chamber.

25. The crystallizing apparatus according to claim 22, wherein the chamber has an outlet for exhausting fluid.

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